COHU

3960HD Helios HDTV/H.264 camera positioning system

- HDTV resolution camera with 720p @ 30 frames/sec
- Integrated motorized 18x optical zoom lens
- Day/Night operation with exceptional low light sensitivity
- Auto/Manual focus and Iris operations
- Dual H.264 and MJPEG video compression CODECs
- Dual independent video streams
- Full function web server
- Simultaneous IP and analog output control
- Variable speed positioning system with 360° continuous pan, +90° to -90° tilt
- Presets, tours, sector zones, camera ID, and postion/direction labels
- IP67/IP66 and Nema TS2 ratings for harsh environments
- Single weatherproof connector for all signals

Cohu Innovation

Cohu's engineering team have combined the advantages of HDTV image quality, bandwidth efficient H.264 compression, a responsive variable speed positioner and advanced environment protection standards into our latest product offering; The 3960HD series.

Expanded Capabilities

This fully integrated, IP-based HDTV/H.264positioning system solves the traditional limitations of fixed position megapixel cameras, by allowing users the ability to optically zoom, maintaining image clarity throughout the zoom range, in lieu of digital zoom, which begins to dramatically reduce the image quality due to pixelization. In addition, operators can remotely adjust the azimuth position of the camera system 360° continuously as well as the elevation 180°, dramatically improving the overall viewing characteristics of the camera site.

HDTV Clarity

The 3960HD incorporates a day/night HDTV quality 720p/30fps camera with an integral 18x optical zoom, providing constant image quality camera views from full wide angle to telephoto zoom settings. The camera uses true Day/Night technology using a removable IR cut filter, providing exceptional low light sensitivity as low as 0.01 fc.

H.264/MJPEG compression

Cohu's 3960HD incorporates the latest H.264 image compression technology for maintaining HDTV image quality while using fractions of the bandwidth traditional fixed position megapixel cameras require.

Cohu's non-proprietary implemention of the H.264 standard insures interoperability with conventional media players such as Quicktime, VLC, and others.

Providing dual output stream capability, the 3960HD can deliver two independently configured H.264 streams or one H.264 and one MJPEG. The MJPEG stream is useful for streaming to web browsers without need for plug-in.

Full Function Web Server

The 3960HD provides a full function web server, allowing complete administrative and operator control capabilities.

Administratve features include configuring network settings, user password assignments, setting video streaming properties, defining camera positioning presets/tours, assigning camera ID labels etc.

Operator features include viewing video and camera pan/tilt zoom functions etc. Access to the camera is protected by user name/password authentication.

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SYSTEM POSITIONING FEATURES

The 3960HD includes a variable hi-speed pan and tilt drive, allowing full 360° continuous pan (azimuth) and ±90° tilt (elevation) movements.

Manual control positioning speeds range from 0.1° to 80° per second, with preset speeds reaching a maximum 120°/sec, resulting in 180° movements in less than 2 seconds.

Preset and directed absolute position movements are precise to within 0.2°, insuring camera views are on target.

CAMERA ID LABELS

The 3960HD provides comprehensive ID labeling, allowing precise descriptors to be inserted onto the video for operator use. Camera location, presets and sector zones are can be defined with up to 24 character labels.

For direct positioning indications, the camera system can display its azimuth and elevation position in degrees as well as use compass style directions.

HYBRID SYSTEM CAPABILITY

Exposing both IP and analog outputs, the 3960HD can integrate with existing analog based camera systems, while providing a smooth transition into the IP world, or both simultaneoulsy. Pre-loaded camera control drivers support a variety of manufactures protocols.

The analog output is a standard composite video (4:3), with an RS 422 control channel.

ADVANCED ENVIRONMENTAL PROTECTION

Because it's made by Cohu Electronics, the 3960HD provides optimum harsh environment protection using an IP67 camera enclosure and IP66 positioner eliminating the effects of water intrusion, pollutants and corrosives that will degrade the system.

As well, the 3960HD is designed to withstand the effects of harsh temperature, electrical and mechanical environments, complying with NEMA TS 2 standards for temperature, electrical, shock and vibration specifications.

Cohu guarantees years of clean, reliable images and backs it with a world-class warranty.

3960HD RESOLUTION PERFORMANCE COMPARISON

Camera Type		3960HD 720p		5MP		3MP		2.1MP		1.3MP	
Magnification Type		OPTICAL		DIGITAL		DIGITAL		DIGITAL		DIGITAL	
Zoom Factor	x1	1280	720	2560	1920	2048	1536	1600	1200	1280	1024
	x2	1280	720	1280	960	1024	768	800	600	640	512
	x4	1280	720	640	480	512	384	400	300	320	256
	x8	1280	720	320	240	256	192	200	150	160	128
	x16	1280	720	160	120	128	96	100	75	80	64
	x18	1280	720	142	107	114	85	89	67	71	57

Resolution Advantage | Resolution Equivalence | Resolution Disadvantage

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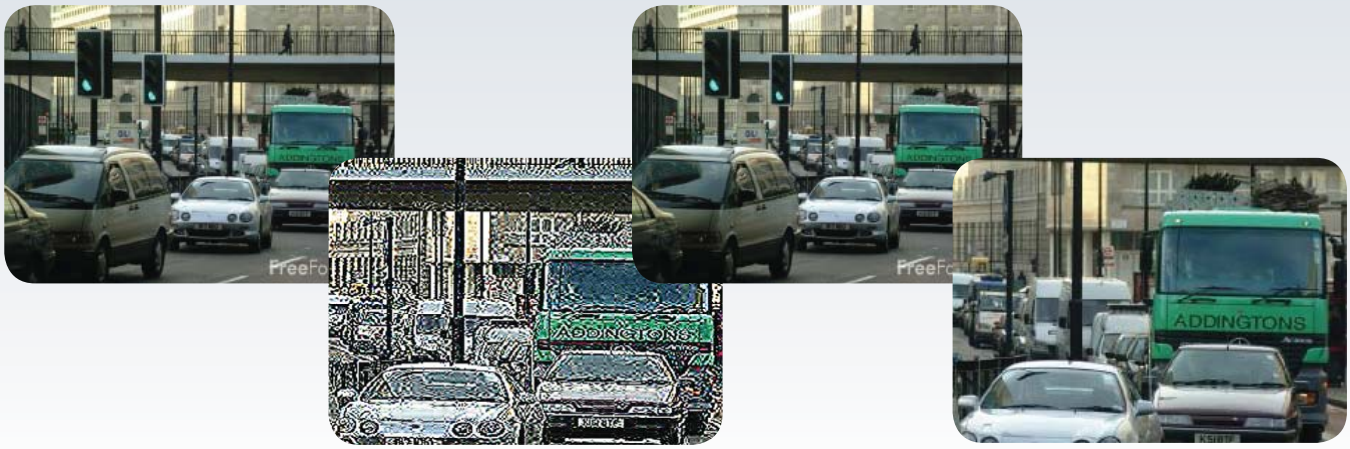
The images below depict the typical resolution advantages of HDTV with optical zoom capability over conventional megapixel cameras using digital zoom for close-up viewing of distant objects.



The chart below compares a 5 megapixel camera and Cohu's 3960HD 720p camera, relative to the (pixels on target) of an object 10ft wide by 5 ft high, at 1,000 feet distance from the camera site.

The pixels on target of the object using the 5 MP camera remain constant across the effects of digital zoom (in order to magnify the object), resulting in reduced image quality of the object.

The pixels on target of the object using the Cohu 3960HD significantly increase across the effects of optical zoom (in order to magnify the object), resulting in higher resolution images of the object.

TRADITIONAL 5 MEGAPIXEL 1/2" CAMERA					COHU 3960HD 720P CAMERA			
SENSOR RESOLUTION		OBJECT SIZE	OBJECT DISTANCE		OBJECT DISTANCE	OBJECT SIZE	SENSOR RESOLUTION	
2560	1920	10FT X 5FT	1000FT	EFL	1000FT	10FT X 5FT	1280	720
HFV	VFV	IMAGE RES	PoT		PoT	IMAGE RES	HFV	VFV
1362	1021	2560x1920	177	4.7 (1x)	59	1280x720	1021	766
681	511	1280x960	177	9.4 (2x)	235	1280x720	511	383
340	255	640x480	177	18.8 (4x)	946	1280x720	255	191
170	128	320x240	177	37.6 (8x)	3750	1280x720	128	96
85	64	160x120	177	75.2 (16x)	15000	1280x720	64	48
76	57	142x107	177	84.6 (18x)	18800	1280x720	57	43

HFV — Horizontal Field of View in Feet (5MP camera based on 1/2" format, Cohu 3960HD based on 1/3" Format)
VFV — Vertical Field of View in Feet (5MP camera based on 1/2" format, Cohu 3960HD based on 1/3" Format)
EFL — Effective Focal Length (based on 4.7mm Lens, where the 5MP camera digitally zooms, Cohu 3960HD optically zooms)
PoT — Pixels on Target. Based on 10ft x 5 ft object 1000ft from camera, defining the number of pixels that are used to display object

3960HD Series Specifications

CAMERA

Image Sensor
Ex-View ICX445AKA Progressive Scan

Sensor Size
6mm Diagonal, 1/3”

Sensor Total Pixels
1296(H) x 966(V)

Sensor Effective Resolution
1280(H) x 720(V)

Day/Night Control
Type: Removable IR cut filter,
Selectable Auto, Color and Mono modes

Sensitivity (F1.6 @ 50% Video)
1.7 Lux (0.17 fc) @ 1/60 shutter, color
0.1 Lux (0.01 fc) @ 1/60 shutter, mono

Focus Operation
Selectable auto focus and manual modes
Manual control of near/far settings

Iris Operation
Selectable auto and manual modes
Manual control of open/close settings

Shutter Operation
Selectable auto and manual modes
Manual control from 1/30 to 1/10,000 sec

White Balance Operation
Selectable auto and manual settings

WDR Operation
Selectable ON/OFF Modes

LENS

Optical Zoom Range
18X, 4.7mm to 84.6mm

Lens Aperture
f/1.6 (wide) to f/34 (tele)

Optical Zoom Speed
Two (2) speeds, from approximately 7.0 seconds to 14.0 seconds full range

Horizontal Angle Field of View
54° to 3.25

Minimum Focus Distance
0.01m (w); 1.0m (t)

H.264/MJPEG ENCODING

Video Compression
H.264 (Main Profile/Level 3.1)
Motion JPEG

Video Streams
Video Stream 1: H.264
Video Stream 2: H.264 or MJPEG

Configurable Properties
Image Resolution: 720p, D1, VGA, CIF settings
Streaming Mode: CBR or VBR settings
Image Settings: GOP (M, N) and quality settings
Frame Rate: 30. 15, 7, 4, 2, 1 frames/sec settings
Data Rate: Adjustable from 64k to 12Mb/sec

Connection Types
Uni-cast, multi-unicast or multi-cast

Video Latency
<250ms

POSITIONER

Pan/Tilt Drive
Pan Range: 360° continuous rotation
Tilt Range: -90° to +90°
Accuracy: ±0.2°
Repeatability: ±0.2°

Pan Speed
Max: 120°/sec
Preset: 180° (start to stop) <2 sec
Manual: 0.1° to 80°/sec

Tilt Speed
Max: 120°/sec
Preset: 180° (start to stop) <2 sec
Manual: 0.1° to 40°/sec

Absolute Positioning
Set Position: 0.2° precision
Get Position: 0.2° precision

Presets
64 preset positions (each preset includes pan and tilt and 24-character ID label)

Video Tours
8 tours, each consisting of 32 presets with dwell time per preset per tour

Sector Zones
Up to 16 programmable zones in the horizontal plane

Compass Direction
8 or 16 direction points (i.e.: north, NE, east, SE, south, SW, west, and NW) can be displayed. Function can be on/off, 3-sec time out or permanent

Absolute Position
Displayed in 0-359° AZ and +90° to -90° EL. Function can be on/off, 3-sec. time out or permanent

Title Generation
Camera ID: 2 lines of 24 characters
Preset ID: 1 line of 24 characters
Sector Zone: 1 line of 24 characters per zone
Compass/Position: 1 line, includes compass direction and absolute position

ELECTRICAL

Power Input
115 VAC (89 VAC to 135 VAC);
Conforms to NEMA TS2 para. 2.1.2.
Optional 24 VAC ±15%

Power Consumption
54 W max without PT heater option
154 W max with PT heater

COMMUNICATION / CONTROL SIGNALS

Network Connection
10/100Base T 802.3 auto negotiate

Network Protocols
IPv4, HTTP, DNS, NTP, RTSP, RTP, TCP, UDP, IGMPv2, RTCP, ICMP, DHCP, ARP

Video
Composite 1vp-p @ 4:3 aspect ratio

Camera PTZ Control
RS422 half duplex, 9600 baud

Firmware
Updates via ethernet connection

MECHANICAL

Construction / Finish
Powder coated aluminum. External parts corrosion protected with stainless steel fasteners. Internal screws/ fasteners nylon or loctite thread-locking

Weight
Approx 18.5 lbs (8.4 kg)

Dimensions
see diagram

Field Connector
PT06E-14-18P(SR) 18 Pin MS environmental connector located on end of 18” Pigtail; Pigtail mating connector included

(continued next page)

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ENVIRONMENTAL

Protection Ratings

Camera
IP-67/NEMA-4X/ASTM-B117;
Positioner
IP-66/NEMA-4X/ASTM-B117

Operating Temperature Limits

-29.2° to 165°F (-34° to 74°C)

Humidity

Up to 100% relative humidity

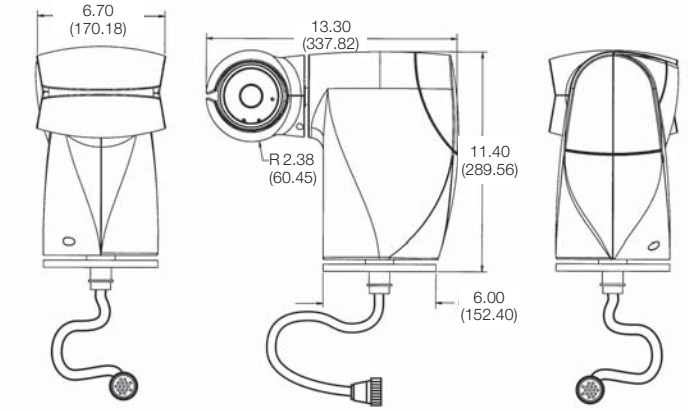
Vibration

Conforms to NEMA TS2, para. 2.1.9

Wind

Survivability: Up to 150 mph without damage (mounting bracket not included)

DIMENSIONS *in inches (mm)*



ORDERING INFORMATION

HD3X–X000

Power

4 - 24 VAC
5 - 120 VAC
6 - 120 VAC with 100W positioner heater

Camera Module

1 - 18x HDTV 720p Day/Night Camera
2 - 18x HDTV 720p Day/Night Camera with Faceplate Wiper

Cohu reserves the right to change specifications without notice.
Trademark names are used for reference only.

COHU
Cohu, Inc. / Electronics Division

COHU ELECTRONICS
12367 Crosthwaite Circle
Poway CA 92064-1245
Tel. +1 (858) 277-6700
Fax: +1 (858) 277-0221

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